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ABSTRACT

Types of alternative educational delivery systems, programming that can be used with these systems, and operational requirements for implementing the systems are considered. Six categories of delivery systems are described: broadcast delivery systems, copy delivery systems, print delivery systems, computer delivery systems, telephone delivery, and satellite delivery systems. Copy delivery systems are those that deliver programs in the form of tapes, discs, or cassettes, and these systems include videocassette, videodisc, and audiocassette. Two major forms of print delivery systems are correspondence courses and courses by newspaper. Additionally, computer managed instruction and computer assisted instruction, and various applications for broadcast television and radio are described. Important considerations in selecting an alternative system include the target audience, the nature of the course content, the cost, and the availability of software or courses to meet identified needs. Points to consider when previewing courseware for use via an alternative delivery system include: the local need or demand, the interest level of the media component; course design and learner objectives; the flexibility of course materials; and whether the materials encourage active participation by the student. Operational support is probably the most overlooked and underrated factor in implementing alternative delivery systems. Students enrolled in alternative delivery courses and faculty teaching these courses require much more than do teachers and students in the classroom. Support functions might include using a microcomputer to do course evaluations and test scoring. (SW)

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HE 014 361

by

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IMPLEMENTATION OF ALTERNATIVE DELIVERY SYSTEMS: ONE PROBLEM DOWN - THREE TO GO

When asked two years ago to speak on the topic "Expanding Alterative Delivery Systems," I had to do research in a great many areas because no one person was yet talking about the myriad of alternative delivery systems available and their impact on education. Within the last year, however, we have seen many journal and periodical articles on the "telecommunications revolution"[1] and the "telefuture."[2]

A notable example of how this topic has risen to the forefront occurred on April 16, 1980 when the TV for Learning Project in Washington, D. C. sponsored a national video teleconference entitled "Update: Adult Learning and the New Technologies." This teleconference was not only about alternative delivery systems, but was also an excellent example of how alternative delivery systems can be utilized for the transmission of instructional information.

The technologies that make alternative delivery systems available to educational institutions are definitely here to stay. Some of these systems are very familiar and others are not. Nevertheless, it is possible for anyone to find out more about an alternative delivery system and how it works. That's "one problem down." We still have three problems to go, however: 1) What alternative delivery systems do we choose? 2) What programming do we use with the alternative delivery systems? and 3) What is operationally required to launch the system and keep it afloat?

ALTERNATIVE DELIVERY SYSTEMS

To briefly review, there are a number of alternative delivery systems which can be examined by us as educators. For convenience sake, I will divide these delivery systems into six major categories: 1) Broadcast delivery systems, 2) Copy delivery systems, 3) Print delivery systems, 4) Computer delivery systems, 5) Telephone delivery systems, and 6) Satellite delivery systems.

Broadcast Delivery Systems

Obviously, the two major broadcast delivery systems are television and radio, but it is there that the simplicity ends. Modern technology has advanced to the point where there are a myriad of instructional applications for radio and television. Included among the applications for broadcast television are: open circuit television, Instructional Television Fixed Services (ITFS), cable television and slow-scan or compressed video; while the instructional applications for radio fall into two main categories: use of the primary carrier and use of the SCA or "subcarrier."

Open Circuit Television. According to Videoplay Report, 98% or 76 million U. S. homes have one or more televisions, while 50% of all U. S. homes have two or more televisions.[3] With this number of home receivers available, an obvious instructional medium is open circuit television.

Open circuit instructional television courses are probably the most understood, yet misunderstood of the alternative delivery systems. The "understanding" comes from the familiarity which we all have with "educational TV." The "misunderstanding" arises from the belief that telecourses are simply "courses on television" rather than integrated learning systems which utilize video and print components, enabling students to "interact with faculty and other 'experts' and experiences in a setting as convenient as the nearest television set."[4] As Tom Gripp, Dean of Telecourse Design at Coastline Community College states,

> A telecourse is not a correspondence course with pictures; nor is it a televised lecture with supplementary readings. It is an examination and presentation of a body of knowledge and information through the use of sight, sound, color, movement and print in a manner designed to stimulate, motivate, clarify and quantify a carefully designed and validated series of learning objectives.[5]

Instructional Television Fixed Services (ITFS). ITFS is a special type of broadcast television designed specifically for the distribution of instructional materials. Established by the FCC in 1963, ITFS is a "point-to-points" system for transmitting as many as four channels to predetermined reception points such as hospitals, libraries, schools or industrial facilities.

The primary source of programming for ITFS studios is copied material, especially videotapes; but ITFS can also be used for transmission of voice and even data with the upper 4 MHz of the frequency spectrum capable of "reverse" transmission either by voice or digital forms. ITFS programming is broadcast

over the air via microwaves and received by special antennas which are within line-of-sight transmission.

Cable Television. Cable television was originally developed to bring television signals to remote areas that were unable to receive satisfactory "off-the-air" signals. Today there are close to 4,000 operating cable systems in the United States, serving approximately 9,000 communities and 40 million people. In contrast to open circuit and ITFS, cable television is transmitted through wire cable and, more recently, optical fiber, giving cable two distinct advantages over other forms of broadcast TV. First, the use of cable greatly improves the quality of the picture. Second, the use of amplifiers allows for a substantial increase in the number of channels which can be received in any one geographical area, including channels devoted entirely to voice and digital information.[6] Cities currently negotiating with cable companies are beginning to see the advantages of this type of broadcast television and are requesting more and more channel capacity. The interactive capability of cable is another reason why educators are beginning to investigate its use in the instructional arena.

Slow Scan or Compressed Video. "Compressed video" refers to frequency or bandwidth compression and, practically speaking, involves the one-way transmission of still pictures with two-way audio--a type of "electronic slide projector." To accomplish this feat, a standard television signal is electronically compressed to the size of an audio bandwidth. This process causes the picture to be stretched in time so that the regular 30-picture-per-second rate of conventional TV becomes a one-picture-per-10 seconds rate for slow scan.

Once the picture is compressed, it can be broadcast over cable, via an FM subcarrier, or it can be transmitted over regular phone lines. At the reception point, the signal enters a video expander which restores the video to its original bandwidth and reconstructs the image on a standard TV monitor.

Radio - Primary Carrier. The use of radio for educational purposes began in 1919 when WHA went on the air from the University of Wisconsin. Today, radio offers us most of the advantages of open circuit television at far less cost.

At Rio Salado Community College we own our own 100,000 watt FM stereo station and this enables us to utilize radio in a number of ways. First, we offer radio courses which are complete integrated learning systems. At this time, we have three such courses in the development or design stage. In addition to courses, we do a great deal of "wrap-around" programming for our

telecourses. These "wrap-arounds" include such things as short "feature" programs on topics similar to our telecourse topics; call-in talk shows with instructors and/or guest speakers; and the use of radio programs to augment telecourse content.

Radio - SCA (Subcarrier). Many colleges and universities around the country are beginning to utilize subcarrier channels in addition to open broadcast radio, but many people are really unaware of the SCA and how it works.

The FCC authorizes an FM radio station to use a portion of the FM bandwidth to broadcast program material to target audiences. These subchannels can be used alongside the main channel without audio disturbance, but can only be received by specially tuned receivers. While a majority of institutions utilizing their SCA are doing so for radio reading services to assist the print handicapped, a number of colleges and universities are beginning to utilize their SCA capabilities for college credit audio instruction.

Copy Delivery Systems

Copy delivery systems are those that deliver programs in the form of tapes, discs or cassettes through a physical distribution system rather than being transmitted electronically.[7] The most notable of the copy delivery systems are: 1) videocassette, 2) videodisc and 3) audio cassette.

The advantages associated with copy delivery systems are obvious. First, reliance on an outside source for delivery of your instructional material is removed and students can truly "take" a course when it is moved convenient for them. Second, copy delivery systems lend themselves very well to self-paced, individualized instruction and to open-entry/open-exit programs. The disadvantages, however, are equally as obvious. Most copy delivery systems will require the student to leave his/her home and travel to some location for playing the particular tapes or cassettes. Copy delivery systems are also not without costs and it is increasingly difficult to maintain a large enough library of tapes and cassettes to accomodate students.

Videocassettes. The videocassette has been used for a number of years as a copy delivery system. Through library learning resource centers, students have been able to view telecourses in videocassette format, often taking them in a self-pace mode. In addition, many institutions use videocassettes in a closed-circuit mode.

Specialized programs such as Tutored Video Instruction at Stanford and Computer Assisted Video Education at the Naval Academy utilize the videocassette in conjunction with other delivery systems for instructional purposes.

Videodisc. Videodiscs are thin, plastic discs similar in appearance to audio records. Although all videodiscs are played in essentially the same manner, there are two major types of videodisc systems: 1) the optical system, which uses a laser or light beam to read information off the disc; and 2) the capacitance system, which uses the more traditional "needle-in-the-groove" technique.

The optical videodisc can offer more to us as educators because it bears some very distinct advantages. First, it is designed to present pictures in both still and motion modes--including slow motion with no distortion of the picture. Second, the optical videodisc has two parallel sound tracks that can be used to record commentary on two different academic levels, or in two different languages, or one track can be used to record questions and the other can be used to record answers. Third, the optical videodisc has the capability of fast forward and fast reverse and can stop precisely on a single frame. Fourth, the quality of the picture on a videodisc is actually superior to the picture of a videocassette. And fifth, the optical videodisc lends itself beautifully to hookups with microprocessors.

Audio cassette. Just as television instruction has overshadowed radio instruction, so has our fascination with videocassettes and videodiscs kept most of us from making maximum use of the audio cassette recorder and more and more people are installing audio cassette recorders in their automobiles.

Why, then, shouldn't we take advantage of this prevalence of equipment by making whole courses available to students through audio cassettes? An entire "Commuter College" could be established and students could listen to their lessons on the way to and from work, completing assignments in the evenings or on weekends. Audio cassettes are inexpensive to buy and duplication is made easy with the use of high-speed duplicators that can make a copy of a 60 minute cassette in roughly two and a half minutes.

Print Delivery Systems

The two major forms of print delivery systems available to us are correspondence courses and courses by newspaper. Both offer students the ability to complete coursework in their homes as they would telecourses or radio courses.

Correspondence Courses. Correspondence courses are sadly under-used by community colleges. I say sadly because correspondence courses truly give the student a chance to master content material at his/her own pace. At Rio Salado Community College, correspondence courses have become a very popular part of the alternative delivery offerings. Students of correspondence courses at Rio Salado attend orientation sessions; have reading assignments; answer questions in a syllabus, which are graded by the instructor; and take monitored midterm and final exams.

Courses by Newspaper. CbN or Course by Newspaper are becoming more and more popular. The CbN produced by the University of California at San Diego are highly sophisticated integrated learning systems which include texts and study guides as well as the newspaper articles.

Computer Delivery Systems

Computer Assisted Instruction of CAI has been used by the educational community for a number of years. Systems such as TICCIT (Time-Shared Interactive, Computer-Controlled Information Television) and PLATO are used by many institutions either as supplementary tools to traditional classroom instruction or as total alternatives to the classroom.

CAI offers us an opportunity to deal directly with each student on a one-to-one basis and, when combined with other alternative delivery systems, can greatly enhance our educational offerings.

The home computer is part and parcel of this type of delivery system. We are currently in the midst of a computer revolution which started in 1975. "Today there are over 50,000 personal computers in the hands of consumers, with that number increasing at a rate above 10% per month."[8] These personal or home computers can offer a dramatic breakthrough for the student who chooses to learn via an alternative delivery system.

Telephone Delivery Systems

For years we've been told to "let our fingers do the walking"; but I don't think any of us every really envisioned this symbolic "hike" as a means of reaching the classroom. It's being proven every day, however, that the telephone is a viable medium for delivering instruction. The primary uses of the telephone are: 1) telelectures, 2) teleconferencing, 3) telewriting and 4) dial access.

Telelectures. Telelectures can best be described as pre-arranged telephone calls from the classroom to a resource person providing students the opportunity to ask questions and to make comments.

Teleconferencing. Teleconferencing, on the other hand, is like a huge party line connecting students in a number of locations, and allowing them to interact with each other and with an instructor many miles away.

Telewriting. The transmission of drawings and graphic materials from one location to another is referred to as telewriting. One such system is the Gemini 100 Electronic Blackboard. Developed by Bell Laboratories, the Gemini 100 is a specially designed blackboard with a pressure-sensitive surface which electronically converts normal chalk strokes into signals that are transmitted over the telephone lines. At the receiving end, the signals are reconverted on a standard TV monitor. The voice portion of a supporting lecture is carried over a second phone line via a Portable Conference Telephone that offers hand-free operations, has a built-in loud speaker and permits discussion between students and the instructor. Material transmitted via the Electronic Blackboard can be used "live" or it can be recorded and played at a later time for the student's convenience.

Dial Access. Perhaps the simplest method for utilizing the telephone for instructional purposes can be found in a small system of manual or automatic tape decks linked to telephone lines by means of recorder-couplets supplied by the phone company. This delivery system is called dial access. When a student needs to hear a lecture, lesson reviews or audio aids like dictation for a shorthand class, he/she simply calls a specific phone number, tells the operator what tape to play and listens away using his/her own phone.

Satellite Delivery Systems

The use of communications satellites impacts on other alternative delivery systems in two ways. First, satellites extend the distribution and delivery of services to persons and places not otherwise served or inadequately served. Second, satellites increase the quality and number of services and programs for areas already served and at affordable costs.

When combined with other delivery systems such as open circuit television, and radio, ITFS and cable, satellites enable instructional programming to become available to persons in rural or remote areas. Consortia such as the Appalachian Community Service Network are beginning to utilize such delivery systems by transmitting telecourses nationwide via satellites.

Television, radio, videocassettes, videodiscs, audio cassettes, home computers, telephones, satellites--with such a wealth of alternative delivery systems available, why aren't educational institutions moving more quickly into the "telefuture"? The answers exist in the three problems which I mention earlier: 1) Which delivery system or systems do we choose? 2) What do we program on the alternative delivery system? and 3) What is operationally necessary to implement it?

SELECTION OF AN ALTERNATIVE DELIVERY SYSTEM

Many of us have "fallen" into the use of specific alternative delivery systems, like open broadcast television and radio, either because of nationally distributed courses such as "The Ascent of Man" and "Adam's Chronicles" or because our institutions have some affiliation with broadcasting stations. Most of us are now at the point, however, when we must seriously weigh the advantages and disadvantages of utilizing new alternative delivery systems. Do we pursue teleconferencing and/or dial access? Where does ITFS fit in? Should CAI be developed for the home computer market?

There are no pat answers to these questions - only more questions. First, we must ask ourselves: "Who are we trying to reach?" Is our target audience the distant learner or the homebound person who simply has no traditional classroom option and, thus, relies on alternative delivery systems for all

instruction? Are we targeting for the "traditional" college student? Is the population we are seeking to serve credit-seeking or are they primarily interested in lifelong learning experiences? Is the target audience centrally located such as in a business, industrial plant or a prison? When we begin to answer these questions we see that a certain alternative delivery system may suit our target population better than another.

For example, if our population is the distant learner or homebound person who is totally relying on alternative delivery instruction, we cannot provide the total program required by open circuit television. There just isn't enough software available and it would be too costly to produce. Probably a better approach would be a combination of delivery systems such as audio cassettes, correspondence courses, open circuit TV and radio, and teleconferencing.

Secondly, we must ask ourselves: "What is the nature of the course content we plan to deliver?" Does the course content require the student to "observe" certain phenomena or events? If so, one of the visual delivery systems should be explored. Is the content primarily oral in nature? A televised vocabulary or music appreciation course would be difficult to produce and a needless waste of time and money. Does the course content "require" or necessitate student/faculty or peer interaction? If so, one of the alternative delivery systems with interactive capabilities such as cable, ITFS or teleconferencing may be used.

The third question on my list, and probably the one we all ask first is: "How much money does it cost?" ITFS may be exactly what your institution needs, but if you do not have $250,000 to make it operational it is not the alternative delivery system for you. You may choose broadcast radio over television because the software is less expensive to produce and air time is usually less costly.

And finally, we must ask ourselves: "What software or courses are available which meet our needs?" The videodisc may be your answer to the first three questions we've discussed, but I only know of four courses on videodisc and they are not yet available for distribution. On the other hand, there are some excellent video courses available for use on open broadcast, cable, ITFS, or in videocassette format. The best delivery system in the world is worthless if you have nothing to deliver.

PROGRAMMING THE ALTERNATIVE DELIVERY SYSTEM

This brings us to the second problem we need to solve: "What kind of programming do we deliver?" In a study funded by the Fund for the Improvement of Postsecondary Education in conjunction with the American Association of Community and Junior Colleges, Dr. Penelope Richardson explored collaborative relationships between community colleges and broadcast stations. In her study, Dr. Richardson asked participants to rate the presence and importance of eight factors which had been previously identified as being integral to successful station/college relationships. The highest rated factor was quality of instructional materials.

Interestingly enough, however, there was no clear agreement on what that meant.

> The definition which received the highest mean rank was: "Materials have substantial education content and meet the standards of the colleges," but close behind was: "Materials meet learner needs, stimulate interest, have broad appeal, and attract large, general audiences."[9]

There is a wealth of software available for use by community colleges and universities, and over a million dollars is spent each year on telecourse production alone. The central questions still remains: What courseware do we use?

None of us can afford to offer "just anything." Alternative delivery systems, by their very nature, have a high degree of visibility and must, therefore, be above average in instructional quality. In addition, courses must be designed specifically for the delivery system so that students have successful learning experiences. A delivery system with nothing to deliver or a delivery system with poor quality courses can cripple an institution that is trying to reach new and underserved populations.

Some points to consider when previewing courseware for use via any alternative delivery system are:

1. What is the local need or demand?
2. Is there a total instructional package complete with textbook and/or study guide?
3. Does the material encourage active participation by the student or does it allow the student to become passive?
4. Is the media component interesting and well produced?
5. Is the course well designed with specific learner objectives?

6. How flexible are the course materials? Can you use a variety of delivery systems or can the materials be easily adapted to meet your specific needs?
7. What is the longevity of the course material?
8. Do you have faculty on content experts available to work with students in the subject matter area?
9. What operational support is required for the course?

OPERATIONAL SUPPORT FOR ALTERNATIVE DELIVERY SYSTEMS

This last question is problem number three: What is operationally required to launch the delivery system and to keep it afloat? Operational support is probably the most overlooked and underrated factor in implementing alternative delivery systems. This is probably due to the fact that bew people beside the students realize its importance.

Students enrolled in alternative delivery courses and faculty teaching these courses require much more support than do teachers and students in the classroom. This support may include everything from simple duplication and dissemination of newsletters to highly sophisticated computer-managed instructional systems like the RSVP system utilized by Miami-Dade Community College.

Each institution differs in the amount and kinds of support it is willing to provide. At Rio Salado Community College, we have a staff of six people who provide various kinds of assistance to students and faculty. Included among the support functions provided to students and faculty is the use of an Apple II micro-computer to do all demographic analysis of students, all faculty and course evaluations and all test scoring.

Not every institution is the same; each student population is a little different; and not all courses require the same amount of operational support. But - and it is a very big "but" - the question of operational support must be addressed whenever an institution is considering the use of an alternative delivery system.

CONCLUSION

I'm not certain there is any one solution or series of solutions to these problems. I am quite sure, however, that many institutions will spend their days with declining enrollments studying these problems to death.

Perhaps Bernie Luskin, President of Coastline Community College, was right when he said that the new technology has moved us along so fast that questions like "Why haven't we," only serve to delay our understanding. If this, indeed, is the case, we should each begin, however gradually it need be, to utilize all kinds of alternative delivery systems. We should awaken our imaginations and the creative talents of our faculty. We should begin to educate our faculty, administrators and governing boards about the potential for learning through alternative delivery systems. We should begin to network with each other to share our successes and our failures.

The technology is here. It is being used and it will be more widely and better used in the future. For those of us who are committed to serving the adult learner, the use of technology is not only a must; it is our future.

END NOTES

[1]Harris N. Liechti, "Toward a New Paradigm: Teaching the Future of Telecommunications," Public Telecommunications Review (May/June 1979), p. 42.

[2]George Bonham, "Education and the Telefuture," Change Magazine (December 1979).

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[4]Stephen K. Mittelstett, "Telecourse Design, Development and Evaluation," in Using Mass Media for Learning, ed. Roger Yarrington (Washington, D. C.: American Association of Community and Junior College), 1979, p. 53.

[5]Tom Gripp, "What is a Telecourse?" Address to a conference on instructional television, Arlington, Texas, 1978.

[6]Herbert S. Dordick, Helen G. Bardley, and Glen Fleck, ITV: A User's Guide to the Technology, (Washington, D. C.: Corporation for Public Broadcasting), 1979, p. 38.

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[8]Ludwig Braun, "Computers and Education - The Promise and the Fulfillment," Apple (January, 1980), p. 4.

[9]Penelope L. Richardson, "Community College and Television Station Collaborations: What Makes Them Work," in Adult Learning and Public Broadcasting, edited by Marilyn Kressel (Washington, D. C.: American Association of Community and Junior Colleges), 1980, p. 19.